Tracking symptom impact in MS patients: longitudinal study of SymptoMScreen scores in patients attending two large tertiary MS centers

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Objective: To report on longitudinal changes in SymptoMScreen scores in MS patients attending two large tertiary MS centres.

Introduction: Natural history studies in Multiple Sclerosis (MS) have largely focused on determining time-to-disability benchmarks. Less is known about longitudinal changes in MS symptom impact from patient's point of view. SymptoMScreen is an in-house developed and validated patient-reported outcome (PRO) for assessing symptom severity in 12 domains commonly affected by MS - walking, dexterity, spasticity, bodily pain, sensory, bladder, fatigue, vision, dizziness, cognitive, depression and anxiety (Green et al, 2016; doi: 10.1080/23279095.2015.1125905)

Methods: SymptoMScreen was collected on consecutive patients attending NYU MS Care Center (NYU) or Barnabas MS Care Center (BH) as part of routine clinical care. We retroactively analysed responses in patients aged 18 or older, who had clinician-diagnosed MS (McDonald criteria) and fully completed 2 or more SymptoMScreen questionnaires over a period of 12 months or more. Disability was assessed with Patient-Determined Disability Steps (PDDS), a PRO that highly correlates with EDSS (Learmonth et al., 2013)

Results: 594 MS patients satisfied our inclusion criteria. Follow up period was 16.69 (±3.69) months (range 12.03 to 38.06).

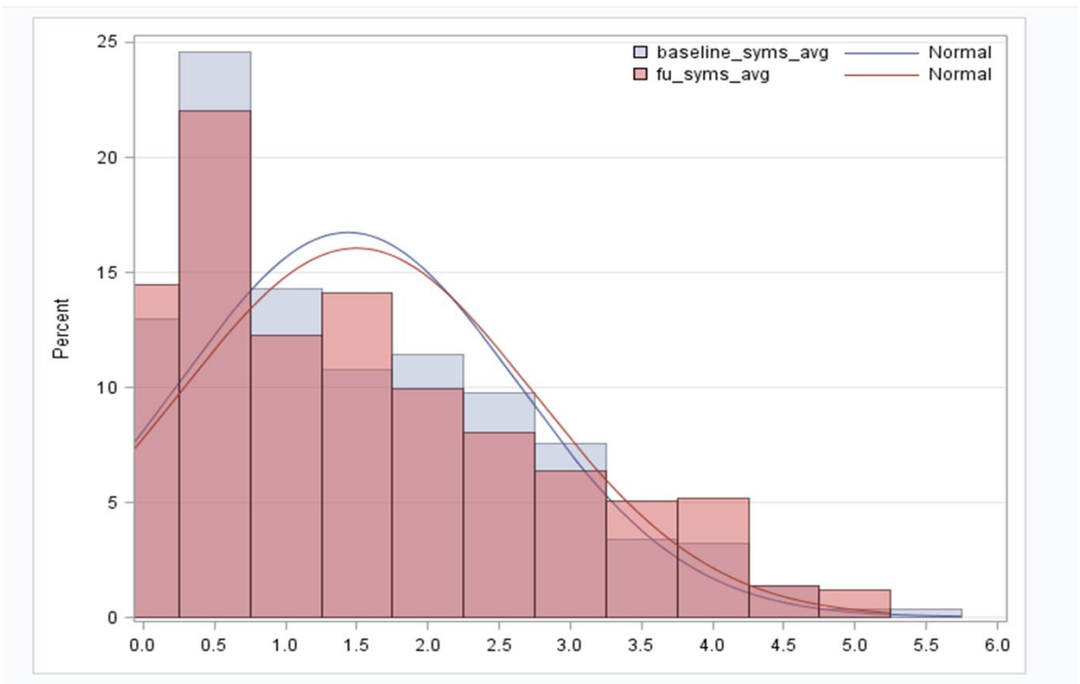
Baseline characteristics

Parameter	All patients	NYU	BH
N	594	386	208
Age in yrs, mean (SD)	44.4 (12.3)	42.9 (12.4)	47.3 (11.7)
Female, n (%)	431 (72.6)	279 (72.3)	152 (73.1)
Disease Duration, In yrs, mean(SD)	11.3 (9.1)	10.7 (9.2)	12.3 (8.9)
Caucasian, n (%)	359 (60.4)	202 (52.3)	157 (75.5)
Follow up, months, mean, (SD)	16.7 (3.8)	16.2 (2.9)	17.6 (4.8)

Change in PDDS and SymptoMScreen by subsets

			PDDS (mean ± s.d.)			SymptoMScore (mean ± s.d.)			Pearson's Correlation [r (p)]
		N	Baseline	Follow-up	Δ	Baseline	Follow-up	Δ	
Age	<= 45	328	1.31 ± 1.62	1.42 ± 1.7	0.11 ± 0.85	1.26 ± 1.18	1.29 ± 1.2	0.03 ± 0.69	0.351 (<.0001)
	> 45	266	2.62 ± 2.26	2.71 ± 2.29	0.08 ± 1.09	1.67 ± 1.18	1.77 ± 1.25	0.1 ± 0.72	0.219 (0.0003)
Gender	Female	431	1.81±1.97	1.88±2.01	0.08±0.94	1.45±1.22	1.49±1.26	0.04±0.75	0.253 (<.0001)
	Male	163	2.15±2.2	2.31±2.24	0.16±1.02	1.43±1.13	1.54±1.21	0.11±0.57	0.374 (<.0001)
Race	Caucasian	359	1.94±2.1	2.03±2.16	0.09±0.94	1.37±1.14	1.38±1.18	0.02±0.62	0.283 (<.0001)
	AA	111	2.07±2.15	2.21±2.21	0.14±1.07	1.56±1.22	1.54±1.2	-0.02±0.79	0.369 (<.0001)
	Other	124	1.62±1.74	1.73±1.67	0.1±0.94	1.55±1.31	1.82±1.43	0.26±0.83	0.208 (0.0203)
MS Subtype	RRMS	454	1.55±1.8	1.62±1.83	0.07±0.94	1.32±1.17	1.38±1.22	0.06±0.69	0.282 (<.0001)
	PPMS	18	4.39±2.45	5±2.09	0.61±1.5	1.63±0.94	1.98±0.94	0.35±0.76	0.488 (0.0398)
	SPMS	35	4.51±1.72	4.54±1.7	0.03±0.95	2.37±1.01	2.41±1.2	0.03±0.59	0.003 (0.9882)
PDDS	<= 3	463	0.99±1.1	1.16±1.32	0.17±0.96	1.14±1.03	1.19±1.1	0.05±0.69	0.34 (<.0001)
	>3	131	5.11±1.18	4.97±1.47	-0.14±0.93	2.52±1.1	2.62±1.07	0.11±0.76	0.113 (0.2005)

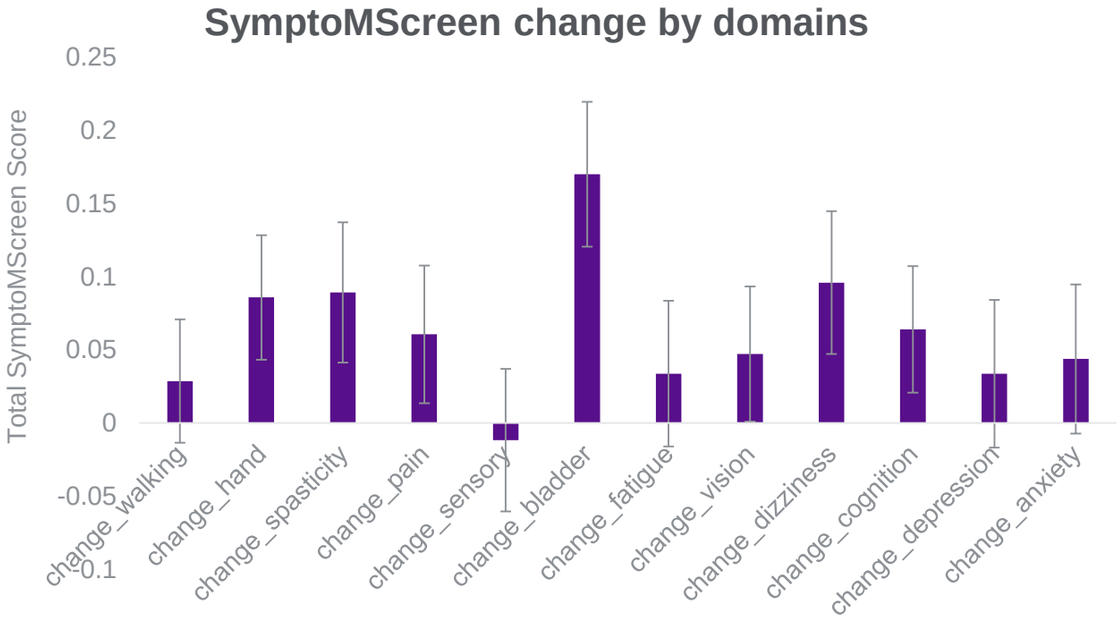
Change in average symptoMScreen score for the cohort



Mean total SymptoMScreen increased from 17.3 at baseline to 18.06 last follow-up (paired t-test, p=0.03)

Mean (PDDS) increased from 1.8 at baseline to 2.0 last follow-up at the last follow up (p>0.05)

SymptoMScreen change by domains



Domain SymptoMScreen significantly increased only in bladder p<0.001, hand p=0.0442 and dizziness p=0.0501 domains

In a multivariable ordinal regression model with change in PDDS as an outcome variable and age, sex, race and symptoMScreen change as predictor variables, only symptoMScreen change was a predictor of change in PDDS (correlation coefficient of 0.28

Conclusions: Overall symptoms botheration, as assessed with SymptoMScreen, has increased slightly but significantly over period of ~17 months, driven mainly by increases in in bladder, dexterity and dizziness domains. Disability (PDDS) increased non-significantly. Change in symptoMScore was the only significant predictor of change in disability score in multivariate model. Change in PDDS correlated with change in SymptoMScreen in most patient subgroups.